MINUTES
of the
SECOND MEETING
of the
SCIENCE, TECHNOLOGY AND TELECOMMUNICATIONS COMMITTEE

July 21, 2011
Room 307, State Capitol
Santa Fe

July 22, 2011
Fuller Lodge
Los Alamos

The second meeting of the Science, Technology and Telecommunications Committee was called to order at 10:00 a.m. on Thursday, July 21, 2011, in Room 307 of the State Capitol by Representative Roberto "Bobby" J. Gonzales, chair.

Present
Rep. Roberto "Bobby" J. Gonzales, Chair
Rep. Cathrynn N. Brown
Sen. William F. Burt
Sen. Dede Feldman (July 21)
Sen. Phil A. Griego (July 21)
Rep. Conrad D. James
Sen. Linda M. Lopez
Rep. Debbie A. Rodella (July 22)
Rep. Nick L. Salazar
Rep. James E. Smith (July 22)
Rep. Luciano "Lucky" Varela

Absent
Sen. Stephen H. Fischmann, Vice Chair
Rep. Jim Hall
Sen. Steven P. Neville

Advisory Members
Sen. William H. Payne (July 22)
Rep. Jane E. Powdrell-Culbert (July 22)
Rep. Don L. Tripp

Rep. Ray Begaye
Sen. Mark Boitano
Sen. Carlos R. Cisneros
Rep. Ben Lujan
Sen. Richard C. Martinez
Rep. Danice Picraux
Sen. John M. Sapien
Rep. Richard D. Vigil

(Attendance dates are noted for those members not present for the entire meeting.)

Staff
Gordon Meeks

Ralph Vincent
Carmella Casados
Jeret Fleetwood

Guests

The guest list is in the meeting file.

Handouts

Handouts and other written testimony are in the meeting file.

Thursday, July 21

After introductions, the committee received testimony.

Telecommunications Regulatory Reform

Leo Baca and Loretta Armenta, representing CenturyLink (Qwest), spoke to the committee about previous legislation on telecommunications deregulation and recovering costs of relocating lines when required by local governments. Two previous bills endorsed by the committee were presented, and the presenters indicated that they would be seeking support again for this legislation. They told the committee that current policy is based on a law enacted in 1985, when competition was not like the current situation. They said that competition exists for local telephone service from wireless providers, voice-over-internet-protocol providers, cable telephone and other wireline providers. Between 2000 and 2010, Qwest access line counts have decreased from 883,000 to 542,000, a 39 percent decrease. During that same time, they said that New Mexico's population has increased 13 percent from 1,819,000 to 2,059,000. While competition in some areas may be more pronounced than in others, there is effective competition in every Qwest New Mexico service area, they said. They said that CenturyLink will request the Public Regulation Commission (PRC) to determine effective competition and establish regulatory parity with existing competitive local exchange carriers on retail pricing and service quality. They said that other significant competitors, such as like cable telephone and wireless, remain unregulated by the PRC.

Mr. Baca and Ms. Armenta also asked for support of revisions to law dealing with metal theft and reported on Qwest's experience with thefts. They asked for new legislation to limit cash transactions so that a secondary metal recycling agent may not pay cash for a purchase of metal in excess of $100 (or lower). They said that limiting the cash payment in a salvage transaction will have a deterrent effect. Also, defining "single transactions" as any sale by the same seller in a 72-hour period would ensure that an individual does not make multiple small sales in a single day to avoid triggering the "no cash" requirement. Requirements for mailing checks to a physical address provided by the seller would ensure that sellers provide legitimate addresses to the salvage yard, thus giving law enforcement a better opportunity to identify and locate thieves. Finally, they suggested inclusion of a provision prohibiting a secondary recycling agent from purchasing or otherwise receiving metallic wire that was burned in whole or in part to remove insulation unless the recycling agent receives from the seller written evidence indicating that the

wire was lawfully burned.

The committee questioned the presenters on and discussed:

- local government approvals of subdivisions without wireline telephone service;
- methods of identification of metal wire for theft prevention;
- the value of copper line losses across all industries and jurisdictions within the state;
- proposed legislation for wire theft prevention;
- a comparison of New Mexico telecommunications regulations to the other 14 states where Qwest/CenturyLink operates;
- the reporting of copper line thefts;
- requirements for metal salvage business licenses;
- gross receipts tax liability of metal sellers;
- the role of the Regulation and Licensing Department over metal salvage businesses;
- Criminal Code provisions for accepting stolen metal;
- the status of Qwest's broadband internet service to Pecos; and
- requirements of recyclers to hold metal for a minimum time period.

Rural Universal Service Support and Long-Distance Interconnections

Sam Ray, John Francis and Jeremy Graves with the New Mexico Exchange Carrier Group spoke to the committee about Federal Communications Commission (FCC) proposed new rules that would place broadband network investments and operations of rural telecommunications companies at risk, to the detriment of rural consumers and small businesses in New Mexico, and intermittent reception of long-distance calls through least-cost telecommunications providers. They testified that the FCC proposes to reduce support from the Universal Service Fund for rural companies and redistribute those resources to companies that have not made comparable investments into the fund in rural America. This approach may reach unserved customers of the larger companies but would make existing network investments of rural telecommunications companies and cooperatives unsustainable.

They also discussed the problem of many long-distance calls not being completed and how this is caused by least-cost routing ("looping") by long-distance call services, not by the local providers that can do little to address the problem. They asked the committee's support for urging the FCC to expedite its investigation into this issue regarding incoming calls being terminated in rural areas.

The committee approved a motion to send a letter to the FCC requesting an expedited action by the FCC to enforce existing regulations that address the issue.

The committee asked about and discussed:

- Western New Mexico Telephone Company's broadband service;
- the status of Qwest interconnections;
- the location of different service providers;
- the process of instituting franchise agreements and permitting rights of way for service;

- the best course of action to expedite a solution to the dropped call problem;
- noncompliance by long-distance providers of the FCC laws requiring fulfillment of service;
- potential cell phone circumvention;
- differentiation of the problem between the "looping" issue or refusal by long-distance providers to complete calls to higher-cost service areas;
- methods to trace the route of each long-distance call;
- the potential for legislation;
- the October 2010 situation that triggered the escalation of dropped calls; and
- how some carriers emphasize quality over price.

Electric Power Transmission and Distribution Developments

Mike Hightower, Sandia National Laboratories, described the major electric power components and the implications of a projected 50 percent increase in power demand in the United States. He said that eastern New Mexico is located where all three large national power grids converge. He said there has been a recent exaggeration about transmission line development in the southwest, as it does not necessarily reflect the reality of expected energy and transmission development. He also discussed smart grid initiatives and utility interests and drivers. The eastern, western and Texas power grids are in different electric "phases" that present some significant technical challenges to integration of these grids, which the Tres Amigas project near Clovis is proposing to accomplish and which will cost billions of dollars to complete. Of the 20 major transmission projects publicized in the southwest, only about 10 percent of them are cost-effective and economically feasible and will be built. Developers of electric power generation and transmission projects in New Mexico are eyeing markets in Arizona, California and Utah. Stated policy in California is to derive all its electric power needs from in state, so Arizona and Utah are the only realistic markets for New Mexico energy exports, he said. He said that the Centennial West Clean Line is the only proposed transmission line in New Mexico that the Western Energy Coordinating Council considers to be cost-effective. He said that power generation requires a lot of water, which New Mexico does not have.

Mr. Hightower said that smart grid and smart metering may improve communications of electric power components, thereby increasing electric efficiency. This would imply that more transmission may not be necessary if consumption rates are reduced by upgrades to distribution and generation systems. He said that other problems are on the horizon, such as securing utility data from hacking. If utilities incorporate smart systems to manage individual appliances in customer locations, the amount of data will increase exponentially and turn the utilities into data management concerns more than electric service enterprises. The utility companies would prefer not to be overwhelmed by this data management challenge, so smart grid nodes or system information aggregators will have a place in the wheeling and dealing or power within the local distribution systems. The information technology industry foresees a trillion dollar per year market in electric power management. These smart grid nodes will allow generation and distribution of electric power to "bundled" locations. He concluded his remarks by saying that the federal Department of Energy will be showing more interest in the future in microgrids and

distributed generation systems.

Questions and comments from the committee addressed:
- the potential for Arizona and Utah to supply their own energy load demands;
- Tres Amigas' plan to convert each of the grids into direct current electricity;
- the power losses in transmission over long distances (a 15 percent to 25 percent loss); and
- direct current efficiency benefits.

New Mexico Renewable Energy Transmission Authority (RETA) Developments

Jeremy Turner, director of the RETA, told the committee that New Mexico is blazing a trail for other western state energy transmission authorities. He began by reviewing the RETA's creation by statute in 2007, explaining that the authority can plan, finance, acquire and own transmission and storage facilities. He also went over the RETA's budget, noting that the authority has enough in its cash balances to keep it funded through fiscal year 2013. Next, Mr. Turner discussed several of the developments being studied in New Mexico, such as the Centennial West Clean Line, Lucky Corridor, Southline Line, High Plains Express and Tres Amigas Superstation. He went on to discuss a study performed by Los Alamos National Laboratory (LANL) that analyzed statewide transmission concepts, economic benefits and cost allocation and subsequent efforts to build projects to address some of the issues raised by the study. Finally, Mr. Turner discussed the RETA's eminent domain power, explaining that while statute provides for the authority's use of eminent domain, the procedures for its use have not been finalized, which the authority is in the process of doing.

Questions and comments from the committee addressed:
- the role of the RETA;
- the financial risk to the state from the RETA projects;
- the use of eminent domain by the RETA;
- the RETA's budget and revenue;
- Bank of America's role as fiscal agent for the RETA;
- the total cost of all the RETA projects ($10 billion);
- the role of Global Infrastructure Partners;
- the rating of the RETA bonds;
- the failure of High Lonesome Mesa to get investment grade ratings for its bonds;
- ownership of transmission lines by the RETA;
- how much power generated in New Mexico would serve New Mexico customers (none);
- the source of money behind project partners; and
- the cost of converting direct current to alternating current.

New Mexico Computing Applications Center (NMCAC) — Supercomputing (Encanto) Facility Status

Tom Bowles, NMCAC director, said the center was created as a New Mexico nonprofit

by the University of New Mexico, New Mexico Institute of Mining and Technology and New Mexico State University regents. The center is a University Research Park and Economic Development Act corporation whose mission is to create well-paying jobs in New Mexico by driving the development of high-tech industries. This is accomplished by coupling the talented people, natural resources and favorable business environment in New Mexico with the power of world-class high-performance computing. The business plan included becoming self-sustaining after five years. Initial capital of $14 million was provided by the state for two years of operation. The center has brought new business, grants and initiatives to New Mexico and is supporting strong education and outreach efforts. It is well on the way to becoming self-sustaining, he said.

Questions and comments included:

- that the initial cost of the supercomputer was about $14 million;
- that the Legislative Finance Committee does not support selling the supercomputer;
- that businesses typically find out about the Encanto facility through its web site;
- that the fee schedule for use of the Encanto facility is competitive, particularly for New Mexico businesses;
- that a program to help small New Mexico businesses has been under development for the past six months;
- long-term funding plans for the Encanto facility; and
- that a gateway in Santa Fe to the LANL supercomputer was set up about two weeks ago.

The committee approved the minutes of the June meeting.

Friday, July 22

Sharon Stover, chair, and Fran Berting, councilwoman, Los Alamos County Council, welcomed the committee to Los Alamos and expressed gratitude to LANL.

LANL Report

Terry Wallace, principal associate director for technology and engineering at LANL, summarized science and engineering activities at LANL. He described the root of the word innovation and said that this is the fundamental story of LANL. LANL has a huge role in the economy of northern New Mexico by employing, directly or indirectly, 10,000 people. He said that LANL encompasses world-class science with a wide range of disciplines. Within its primary defense focus are research programs to counter nuclear terrorism and cyberattacks. Other research areas include human health and solar power. The annual budget ranges from $700 million to $800 million in research and development. All LANL programs fall into one of three technology readiness levels: fundamental science; basic science leading to commercialization; and manufacturing. With the exception of pit production, LANL has done no manufacturing.

Mr. Wallace highlighted research in algae as a biofuel. Lipids are essential liquid fuels

for transportation. Algae as a potential source for biofuels is close to carbon-neutral. These fuels can be designed to be efficiently manufactured on demand. LANL is researching how to enhance production levels, separate the lipids from solids and manage the byproduct wastes. He said that New Mexico is an ideal location for algae production with a potential to produce seven to nine percent of the country's diesel fuel needs. LANL is conducting research to identify the best algae strains for the purpose, the acoustic methods of separation of lipids from solids and how to trap the produced carbon dioxide for reuse to achieve a closed loop.

Another area of LANL research Mr. Wallace described is intelligent wind turbines. He explained that wind is an intermittent energy source. Large turbines do not have a long life expectancy because wind turbulence causes "micro" cracks. LANL is researching better material for blade manufacturing with two turbines equipped with sensors that collect data to characterize their reliability problems. Increasing the life cycle of wind turbines can increase efficiency and power.

Mr. Wallace said that LANL's nuclear research is using the lab supercomputer to model reactor life cycles in an effort to find out how to minimize calcium carbonate build up in commercial reactors, which is the primary cause of aging.

The committee asked about and discussed:
- land requirements for algae diesel production;
- new design for nuclear reactors;
- industrial partners of LANL;
- patent ownership and intellectual property;
- research on plants' growth rates;
- electrical energy storage technologies;
- flow cytrometry licenses;
- progress on small-scale nuclear reactor technology research;
- computer-designed buildings to reduce energy consumption;
- potential jobs from the algae biofuel industry;
- partnerships with New Mexico universities;
- the use of geothermal energy for the Carlsbad cave and karst building; and
- prospects for fusion energy.

Education and Community Investment Plan

Kurt Steinhaus, community programs officer, LANL, told the committee that the management consortium of LANL (Los Alamos National Security, LLC (LANS)) returns half of its annual profit to New Mexico. He summarized community giving, education outreach and economic development and said that $3.5 million has been invested in New Mexico, so far, by LANS.

The committee asked about and discussed:
- LANS' relationship with small business development centers;

- the cap on the small business assistance tax credit (10 percent);
- the Brian Sanderoff report on return on investments;
- the retraining of employees displaced by technology;
- northern New Mexico students finding jobs at LANL;
- the lab's relationship with the Pueblo of Santa Clara;
- an overview of the LANL budget, number of employees and contractors;
- the Taos Technology Charter School;
- LANL's relationship with New Mexico educational institutions; and
- Sandia National Laboratories' relationship with Albuquerque's schools.

Information Technology Investments at LANL

Elaine Santantonio, manager of network infrastructure engineering at LANL, told the committee that her biggest challenge is the 1,000 cyberattacks per second targeting LANL's computer network. She said that most infections come from email. LANL networks have to be absolutely secure because top-secret research is conducted there. She said that LANL has been successful at attracting top-level talent and expertise to design its security system. LANL must maintain continuity of operations 24 hours a day. The extreme cold spell during the winter of 2011 caused a shutdown of data centers at LANL, and the Las Conchas fire also shut down the lab for six days. She said that LANL is consolidating its computer network into one central computer site for efficiency and security.

Committee questions and discussion addressed:

- the definition of "center of excellence";
- fiber optic access to LANL and rights of way;
- the impact of 9/11 on LANL internet access;
- partnerships with industry;
- the partnership with national security agencies in Washington;
- indicators of security breaches;
- the need to inspect every data packet;
- 24 hours per day, seven days per week monitoring;
- malicious employees; and
- expertise at the New Mexico Institute of Mining and Technology.

The meeting adjourned at 11:25 a.m.